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Revisiting L2 Reading Comprehension With High And Low Proficient English Language Learners In A Multimedia Setting

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ABSTRACT

This article reports on an experimental study that investigated the role of language proficiency on second language reading comprehension and retention, comparing EFL intermediate learners (N=37) to advanced (N=43) at a university in Istanbul. All learners were exposed to three hypermedia text types in English: animation with narration (AN), animation with narration and on-screen text (ANT), and animation with sequential narration and on-screen text (A-NT). Their performance was measured by retention and transfer test. The results first showed that advanced learners outperformed intermediate learners on both tests given after A-NT, AN, and ANT presentations, respectively. Next, although both groups performed the worst in ANT text type, the advanced still scored better than the intermediate. In addition, as well as favouring the test data, interview results explored that whether the narrator in multimedia presentations is native or non-native speaker serves a major role in helping learners process the information in working memory, thereby showing language proficiency is not a single factor that paves way for better reading comprehension in L2. A series of implications are given and suggestions made for English language teachers and multimedia researchers.

INTRODUCTION

Second language reading, a multi-faceted and multi-lingual construct, has received a lot of attention in recent years, specifically bringing new insights to discussion on to what extent reading performance and second language development are both interdependent. 32 golden years have passed since Charles J. Alderson (1984) published his seminal article, posing with a celebrated question “Is second language reading a language problem or a reading problem?” which has prompted a number of studies to seek out the answer of whether poor reading in a foreign language is because of poor reading ability in the first language or because of insufficient linguistic knowledge in the second language.

A number of studies found that learners transfer their reading abilities in L1 while interpreting and producing various aspects of their L2 such as phonology (e.g., Hancin-Bhatt & Bhatt, 1997), morphosyntax (e.g., Hakuta, 1976; Hancin-Bhatt & Nagy, 1994), metalinguistic awareness (e.g., Durgunoglu, Nagy & Hancin, 1993; Koda, 1998, 1999), pragmatics (e.g., Rutherford, 1983; Yanco, 1985), and communicative strategies (e.g., Cohen, Olshtain, & Rosenstein, 1986; Olshtain, 1983; Scarcella, 1983). All these studies argued that once developed, reading abilities in one language can be transferred to another, finding great support from Goodman’s (1973) definition of reading as “psycholinguistic guessing game” in which learners based on what they read in their L1 firstly create hypotheses immediately before reading in L2 and then either confirm or disconfirm their predictions while reading. Additionally, Cummins, (1979, 1984, 1991) proposed his “developmental interdependence hypothesis”, arguing that learners’ prior reading ability in L1 determines the forms and levels of their competence in L2, in the absence of which while “learning to read” is attainable, “reading to learn” is formidable (Koda, 2005). Especially bilingual studies (e.g., Cummins, 1979, 1991; Cummins & Mulcahy, 1978; Legarreta, 1979; Troike, 1978) found significant relationship between L1 and L2 reading abilities, exploring that the older students with greater L1 literacy experience, the better for developing L2 reading competence.

However, most empirical studies (e.g., Bernhardt & Kamil, 1995; Bossers, 1991; Carrell, 1991) gave much more importance to the role of linguistic knowledge in L2 than that of reading ability in L1, pointing out that inadequate linguistic knowledge is the leading factor that causes poor reading performance in L2. For instance, Yorio (1971) had claimed that “guessing or predicting ability necessary to pick up the correct cues is hindered by the imperfect knowledge of the language.” (p. 108) Clarke (1980) put forward “short-circuit hypothesis”, claiming that “limited control over the language “short-circuits” the good reader’s system causing him/her to revert to poor reader strategies when confronted with a difficult or confusing task in the second language” (1988, p. 120). Specifically, Bernhardt (2005) stated that on second language reading comprehension while the level of L2 linguistic knowledge is 30%, L1

literacy is 20% and the role of unexplained variance is 50% (such as engagement, content and domain knowledge, interest, motivation etc.). Much more recently, Bilikozen and Akyel (2014) conducted research on advanced and intermediate EFL learners to measure any relative contribution of individual-differences (such as prior knowledge, topic interest, linguistic proficiency, gender, reading motivation, and metacognitive awareness) to EFL reading comprehension and found out that linguistic proficiency itself explained 39 % of the variability.

As to the role of language proficiency in L2 reading comprehension, this study therefore specifically set out to investigate the role of language proficiency on L2 second language reading retention and comprehension. However, with regard to the instructional treatments, contrary to traditional pen and paper reading text types, the study exposed the participants to texts prepared according to rationale of multimedia theory of learning. The following section provides some information about multimedia learning briefly giving reference to the literature.

PREVIOUS RESEARCH ON MULTIMEDIA PRESENTATIONS

Two conspicuous theories are addressed in the literature related to multimedia learning: cognitive load theory (e.g., Paas, Renkl, & Sweller, 2003; Sweller, 1999; Sweller, van Merriënboer, & Paas, 1998) and cognitive theory of multimedia learning (e.g., Mayer, 2001, 2005), explaining cognitive processing and mental representations in working memory. While cognitive load theory argues three separate but additive sources of cognitive load in memory i) germane load, ii) extraneous load, and iii) intrinsic load, cognitive theory of multimedia learning explains learning process considering three assumptions i) dual-channel (e.g., Clark & Paivio, 1991; Paivio, 1986), ii) limited capacity (e.g., Baddeley, 1992; Chandler & Sweller, 1991), and iii) generative learning.

According to both theories, when learners listen to a text by getting help from an animation, they are more likely to comprehend the text because both animation and narration (AN) does not lead to cognitive load in working memory. However, when the text is narrated, animated, and written on the screen (ANT), then the likelihood of lack of comprehension will increase as both on screen text and narration lead to verbal redundancy. In order to make animated narration “more concise and coherent” (Mayer & Moreno, 2003, p. 48) and to free working memory capacity (Diao & Sweller, 2007), one of the components (e.g., on-screen text) should be either weeded like AN presentation or presented sequentially like A-NT presentation.

Some studies found out that redundant material such as on-screen text has detrimental effect on retention and comprehension (Craig, Gholson, & Driscoll, 2002; Diao & Sweller, 2007; Jamet & Bohec, 2007; Kalyuga, Chandler, & Sweller, 1998, 1999; Leahy, Chandler, & Sweller, 2003, Experiment 2; Mayer, Heiser, & Lonn, 2001). Kalyuga et al. (1998, 1999) therefore argued that elimination, not inclusion, of the redundant material leads to better performance and thus more meaningful learning. Similarly, Mayer et al. (2001) compared students receiving AN to those receiving ANT, and found that on-screen text in ANT presentation led to overload in working memory, thus causing less retention and comprehension. Craig et al. (2002, Exp. 2) likewise explored redundancy effect between two groups of students, receiving either an agent-spoken only presentation or an agent spoken-plus-printed presentation. It was found that the printed text and the picture caused to poor processing and representation in visual working memory; thus inducing split attention.

Diao and Sweller (2007) also found redundancy effect, exposing learners either to reading-plus-listening presentation or to reading only presentation. The results showed that learners who read and listened simultaneously had heavier mental load, and therefore they were not able to perform as well as those who read only. Gorsuch and Taguchi (2010) investigated the effects of repeated reading on second language reading comprehension, and asking learners to read each text five times and to listen to it. Learners, however, listened to the text sequentially after first time reading session, which provided less cognitive load in their working memory but more comprehension and fluency. Put simply, providing identically analogous information by involving two different learning channels, to cognitive theory of multimedia learning, is most likely to enhance meaningful learning.

THE STUDY

This experimental study sought to find out any effect of language proficiency on second language text retention and comprehension, providing both intermediate and advanced learners manipulated text in three different types: i) animation and narration (AN), ii) simultaneous animation with narration and on-screen text (ANT), and iii) animation with sequential narration and on-screen text (A-NT).

The research questions which underpin the study reported in this article therefore were:

1. In which type of presentation do intermediate and advanced learners of English show better performance measured by retention and transfer test?
2. Is there a significant difference between intermediate and advanced learners of English when they are exposed to redundant (ANT) and non-redundant (AN) presentation?
3. What do the participants think about whether the narrator is native speaker or non-native speaker?

The hypotheses related to the research questions were as follows:

For first research question, both intermediate and advanced learners were predicted to remember more idea units and produce more creative solutions in A-NT than AN, and ANT presentations respectively (Moreno & Mayer, 2002, Exp. 2; Jamet & Bohec, 2007; Soruç, 2011). Sequential presentation of the on-screen text was hypothesized to facilitate cognitive processing and mental representations in working memory (Hypothesis 1).

For the second research question, given that limited language proficiency ‘short-circuits’ learners’ processing strategies, causing them to use strategies that poor readers generally have, it was then hypothesized that advanced learners of English would outperform intermediate learners on both AN and ANT retention and transfer test irrespective of presentation type (Hypothesis 2).

With regard to their preferences in the third research question, both advanced and intermediate learners were predicted to listen to a text voiced from a native speaker because of “real” and “standard” or “correct” pronunciation (Hypothesis 3).

Setting and participants

The research was carried out at a preparatory school of an English-medium university in Istanbul, Turkey, where English was taught as a foreign language (EFL). At the time of the study, before entering the faculty of their choice, all learners had to take Michigan Proficiency and Placement Exam at the school, according to which they were either allowed to enter the faculty directly or were placed into different levels where they worked until they reached a satisfactory level of proficiency.

According to their proficiency level, 80 learners were recruited for the study; two intermediate classes (N=37) and two advanced (N=43). While in the intermediate group, 62% were female and 38% male, in advanced group, 54% female and 46% male. All participants were native Turkish speakers who had studied English at primary and secondary school for almost eight years before getting into university.

Materials

Pre-Instructional materials

Before the study started, learners were first given a letter asking their consent to participate and to the results of the study being used for research purposes and possible publication. All were happy to sign and to participate. Second, to measure learners’ level of knowledge on the instructional topics such as water cycle, earthquakes and photosynthesis and to leave out those who might have better domain knowledge related to the topics, they were given a prior knowledge test, a five-point Likert scale, but no one was removed on the grounds that all the participants had already insufficient topic knowledge related to the texts.

Instructional materials

Three different types of Power Point slides were given to the learners as used in the previous research (Soruç, 2011). First, the process of how water cycles was animated and narrated (AN); it consisted of seven slides, taking a total of 44 seconds. Then, the process of how earthquakes happen was simultaneously animated and narrated with on-screen text (ANT), a ten-slide presentation completed in 117 seconds. Finally, the process of how photosynthesis occurs was first animated and then sequentially narrated via on-screen text (A-NT), nine slides completed in 160 seconds. The slides advanced automatically. Both advanced and intermediate learners were exposed to the three types of presentations: AN, ANT, and A-NT, respectively. On-screen text was fully written under each slide in ANT and A-NT materials (see Appendix for the example). Learners could not replay the instructional slides and were required to complete both retention and transfer test immediately after each type of presentation.

Assessment materials

Upon completion of each type of presentation, learners immediately took a retention test, asking them to write freely what they remembered about the content of the presentation. This was followed by a transfer test, which aimed to

measure learners' interpretation (comprehension) level of the target topic. The retention test lasted about five minutes; the transfer test about 10 minutes.

Scoring

On the retention test, as each of the topics presented to the learners consisted of six definite key idea units in common, one item-one-point procedure was used. One point was assigned for each correct idea; thus having no partially-correct response and partially-correct credit. Spelling or grammar mistakes were completely ignored on condition that the key propositional idea was written. The highest score was therefore six for each topic. The transfer tests consisted of seven comprehension questions for each of the presentation types. One item-one-point procedure was similarly followed; thus the highest score was seven. Wording and grammar mistakes were ignored.

Interviews

After all texts were presented, focus-group interviews were conducted with randomly selected ten intermediate and ten advanced learners to elicit their opinions of whether they comprehended the text when the narrator is a native speaker or a non-native speaker, because while one of the texts (AN) was narrated by a native speaker, the other (A-NT) was narrated by a non-native speaker. Thus, they were asked such questions as:

1. Did you like the presentation types?
2. Which one did you like much?
3. Do you prefer a native speaker or non-native speaker's voice?
4. How does it affect your comprehension when you receive a text narrated by a native speaker or by a non-native speaker?
5. Why?

The interviews were held by inviting small groups of three to five students to meet with researchers after class. Small group interviews were considered suitable for this study since the presence of peers might encourage participants to contribute and help them to remember things they might otherwise have forgotten (Dawson, 2009, chapter 3). The first question was both to warm up the interviewees and to ensure a basic understanding of the texts presented differently. Question 2 and 3 aimed to investigate the interviewees' personal opinions. Question 4 was designed to explore their preference as to when the text was narrated by native speaker or non-native speaker. Question 5 was to encourage the interviewees to elaborate on their preference. The interviews were recorded on a small portable recording device and notes were taken by the first author. After transcribed, the data were analysed to explore whether learners give importance to native speaker or to non-native speaker as narrator.

RESULTS

Test Data

The highest score was six on retention test; seven on transfer test. To find on which type of presentation the participants had highest performance, descriptive statistics were conducted for both retention and transfer test scores and displayed in Table 1 and 2. To explore any significant difference between intermediate and advanced students on non-redundant (AN) and redundant (ANT) retention and transfer test, independent sample *t*-tests were run for the analyses.

Table 1: Mean scores and standard deviations of intermediate students on retention and transfer test for three presentations

	Retention Test		Transfer Test	
	M	SD	M	SD
A-NT	2.50	.51	2.67	.61
AN	3.47	.94	2.80	1.50
ANT	2.37	.77	2.10	.76

Table 2: Mean scores and standard deviations of advanced learners on retention and transfer test for three presentations

	Retention Test		Transfer Test	
	M	SD	M	SD
A-NT	5.37	1.03	4.93	.91
AN	4.20	.98	4.17	1.29
ANT	3.23	.68	3.43	.50

RQ1: In which type of presentation do intermediate and advanced learners of English show better performance measured by retention and transfer test?

The mean scores of the retention test showed that advanced learners performed much better than intermediate learners on all types of presented text. Put another way, while advanced learners gained higher scores respectively on A-NT ($M=5.37$, $SD=1.03$), AN ($M=4.20$, $SD=.98$), and ANT ($M=3.23$, $SD=.68$), intermediate learners gained lower scores on AN ($M=3.47$, $SD=.94$), A-NT ($M=2.50$, $SD=.51$), and ANT ($M=2.37$, $SD=.77$).

The mean scores of the transfer test likewise showed that advanced learners outperformed intermediate learners on each of the presentation materials. That is, advanced group produced many creative solutions when answering comprehension questions respectively on A-NT ($M=4.93$, $SD=.91$), AN ($M=4.17$, $SD=1.29$) and ANT ($M=3.43$, $SD=.50$).

RQ2: Is there a significant difference between intermediate and advanced learners of English when they are exposed to redundant ANT and non-redundant AN presentation?

The results showed a significant difference. First, independent sample t -test analysis was run for any difference on non-redundant AN retention and transfer test results, which showed that advanced learners ($M=4.20$, $SD=.98$) remembered significantly better than intermediate learners ($M=3.47$, $SD=.94$) on AN retention test, $t(78) = 2.94$, $p=.005$. The same analysis also revealed the superiority of advanced learners ($M=4.17$, $SD=1.29$) over the intermediate ($M=2.80$, $SD=1.50$) on the same AN transfer test, $t(78) = 3.79$, $p=.000$.

Next, to find out any difference between the groups on redundant simultaneously presented ANT retention, t -test analysis was conducted and according to the results it showed that advanced group ($M=3.23$, $SD=.68$) performed significantly better than the intermediate group ($M=2.37$, $SD=.77$) on the retention test, $t(78) = 4.64$, $p=.000$. On ANT transfer test, the same result was again found, advanced learners ($M=3.43$, $SD=.50$) outperforming the intermediate ($M=2.10$, $SD=.76$) learners, $t(78) = 8.01$, $p=.000$.

Focus Group Interview Data

In addition to investigating any improvement of advanced and intermediate learners, this study also looked into the participants' opinion related to the role of English native speaker or non-native speaker narrator who voiced the texts (the third research question). Thus, interviewees were asked whether they comprehended the text much more when the text was narrated by native speaker than when it was narrated by non-native speaker. Almost all interviewees ($N=17$) whether advanced or intermediate stated that they liked all types of texts presented in different ways, but notably the one narrated with sequential animation and on-screen text (A-NT), and as for the reason arguing that they were not felt overloaded by the information in the video because they had enough time to read the text after some time when the animation was given. Specifically, five interviewees (3 advanced, 2 intermediate) stated for A-NT text type that:

Interviewee 2: The animation given before the text on screen helped me to make some predictions about content of the text, and then either to confirm or disconfirm my hypotheses.

Interviewee 5: The animation gave me a visual picture on which when the text was written, it provided me to combine what I saw with what I read, and allowed me to recall more ideas related to the text.

Interviewee 8: The text written on-screen and simultaneous narration did not cause overload in my memory, because I felt already ready thanks to the earlier animation.

Interviewee 15: I was able to read and comprehend the text easily in A-NT text type because of the sufficient time I had after animation.

Interviewee 18: The text and narration would cause overload in my working memory when the text was not narrated by a non-native speaker.

Upon those responses of the interviewees, especially after the response of the interviewee 18 attributing greater importance of listening to a non-native speaker, rather than native, as a narrator, the interviewees were asked why they preferred A-NT material over AN, and ANT respectively. All learners stated that they preferred a text narrated by a non-native speaker to the one narrated by a native speaker. When their opinions as for the main reason were further asked, in contrast to the common view, the interviewees ($N=18$) argued that it was much more comprehensible when the text was narrated by non-native speaker than when narrated by native speaker, which thus showed that sequential on screen A-NT presentation type is not the only factor that might influence better retention and comprehension. Whether a native speaker or non-native speaker narrates the text also plays an important role for better recall and comprehension irrespective of whether learners are advanced or intermediate. Interviewees stated specifically that

Interviewee 4: I felt more relaxed when I heard a pronunciation similar to mine.

Interviewee 11: The narrator in A-NT sounded more like me; so I did not find him incomprehensible.

Interviewee 13: I could combine the text in A-NT easily with what the non-native speaker said, because he was easy and comprehensible to follow.

Interviewee 14: I was not in hurry when it was narrated by non-native speaker, but when it was narrated by a native speaker I felt uncomfortable and anxious.

Interviewee 17: Although I am at advanced level, what the native speaker as a narrator told in AN was unclear to me.

Interviewee 20: I found the native speaker in AN too difficult to understand because of his difficult accent.

In conclusion, as for the test results showing both advanced and intermediate learners performed better on A-NT than ANT text type, the interviews found two main reasons: the role of sequentially presented on screen text as found in the literature (Moreno & Mayer, 2002, Exp. 2; Jamet & Bohec, 2007; Soruç, 2011) and non-native speaker as a narrator (Soruç, 2015)

DISCUSSION & SUGGESTIONS

This study investigated any role of language proficiency on second language text comprehension – manipulated text according to the rationale of multimedia theory of learning. First, the results showed that language proficiency is a significant factor that helped advanced learners in the study to outperform intermediate learners on the three types of texts. The only difference between the groups was that while advanced group performed the best on both tests after A-NT text presentation, the intermediate on AN text presentation. Having said this, it can be argued that the first hypothesis was partially confirmed, predicting that both groups would remember more idea units on retention tests and produce more solutions on transfer tests on A-NT, AN, and ANT text types, respectively. The performance difference between the groups still showed that redundancy effect remains for both levels of proficiency as they performed the worst on simultaneously presented ANT presentation.

The fact that the mean scores of the advanced were the highest on A-NT, according to research in the literature (e.g., Moreno & Mayer, 2002, Exp. 2), shows that the text does not create the redundancy effect on condition that it is sequentially provided after animation; instead, the text has beneficial effect for learners' better retention and comprehension. That is, detrimental effect of on-screen text (such as split attention) could be minimized when animation precedes the text. As with the result of this study, Moreno & Mayer (2002) found out that redundant text group (A-NT) performed much better than non-redundant without text group (AN) when the text was sequentially presented.

Adesope and Nesbit (2012) did a meta-analysis involving 57 studies to explore the effects of spoken-only, written-only, and spoken-written presentations on retention and transfer and it was likewise found that although the performance of the spoken-only group and the written-only group did not differ, learners who were exposed to spoken-written presentations gained better scores than those receiving the spoken-only presentation. However, this finding was dependent on learners' prior text knowledge, pacing of presentation, and inclusion of animation. Put simply, when reading a text, learners have many other components to overcome for better retention and transfer.

Yue, Bjork, and Bjork (2013) carried out two studies, in which they exposed learners to a redundant on screen text either having greater discrepancy with the animation or having lower discrepancy with the animation. They found that too much discrepancy is detrimental to learning and remembering; whereas slightly worded text is better for learning.

Similarly, in their recent research, McCrudden, Hushman, and Marley (2014) exposed their participants either to a redundant condition in which they read a scientific text while watching a corresponding visual display with redundant text segments or to a non-redundant condition in which the scientific text was given without text segments on the visual display. It was found that redundant text segments helped their participants to enhance their retention test scores significantly, which thus shows that when manipulated, the redundancy effect may not have detrimental effect on memory. All these results are consistent with the results of the present study, finding out that especially advanced learners performed much better on A-NT presentation than on AN and ANT text types on condition that the on-screen text was manipulated. It was however AN, A-NT, and ANT, respectively, for the intermediate learners, still showing that redundant text type ANT was the least performed.

The second hypothesis predicting that advanced learners would perform better than intermediate learners on both redundant ANT and non-redundant AN text types was confirmed, because advanced learners outperformed intermediate learners on both types of tests. This effect can be attributed to the role of language proficiency. That is, those highly proficient learners in the language were able to deal with animation and narration only (AN) to remember more idea

units than those less proficient. This outcome partially confirms Clarke's (1980; 1988) "short-circuit" hypothesis, claiming that limited control over the language may preclude notably the intermediate to process the data in the input and thus may cause them to revert to use the strategies that poor readers generally prefer.

However, on the other side of the same coin, it is easy to notice that the advanced group still performed their worst on animation and on-screen text (ANT) text type. The fact that having better control over the language or in other words being a highly proficient reader can provide advanced learners an advantage was not confirmed in this study, especially when redundant ANT was presented. This result showed that language proficiency is not the single factor per se that is likely to enhance or preclude comprehension; but rather it showed that there may be some other components such as split attention effect. Chandler and Sweller (1991) and Baddeley (1992) put forward "limited capacity assumption" suggesting that information processing channels have limited capacity at one time and argued that if one learning channel is overloaded, the split attention effect occurs. Furthermore, Ketabi, Ghavamnia, and Rezazadeh (2012) carried out research on cognitive strategies that Persian EFL graduate students used while reading a hypermedia text and found out that 'only 8% of the information-processing techniques' (p. 45) were related to annotations on the hypermedia text. It is most likely because of the simultaneous presentation of the redundant on-screen text, which caused the split attention effect. In addition to the split attention effect, second language reading researchers should consider Bernhardt's (2005) unexplained area (50%) for better reading comprehension (e.g., engagement, content and domain knowledge, interest, motivation etc.)

According to the results of the present study, the unexplained area that Bernhardt pointed out should also include "non-native speaker" as a narrator especially in hypermedia text comprehension; therefore, the third hypothesis was not confirmed. Contrary to common view, the participants in this study did not prefer a native speaker narrator. Learners stated that they comprehended the text when it was narrated by a non-native speaker. It corroborated the same result found in Soruç's (2015, p. 2847) study, similarly having revealed that when narrated by a non-native speaker, the learners felt "more relaxed" and more "intelligible" as it did not further cause hurdle on working memory capacity.

As a result, it can be argued that language proficiency in L2 is important, but it is not the only component that paves the way for better comprehension. There can be some other components to consider such as sequential presentation of the redundant on-screen text and native speaker as narrator.

Bearing these results in mind, both textbook writers and especially language teachers can restructure their classrooms. For instance,

- As redundant it seems, on-screen text can be manipulated if it is presented after animation.
- In addition to native speaker narrator, textbooks could include a non-native speaker to narrate the text.
- Linguistic knowledge should be increased for better retention but it is not enough because there is no certain linguistic threshold, which changes according to the task (Carver, 1990; 2000).
- Bernhardt's unexplained area necessary for better reading should be considered carefully. Learners' engagement, motivation, and interest should be enhanced.

CONCLUSION

Exposing both advanced and intermediate EFL learners to three different types of text prepared considering the multimedia theory of learning, this study explored the role of language proficiency in L2 for better comprehension in second language reading. More important, it also found out that when manipulated, the on-screen text can help both groups of learners, irrespective of language proficiency, to learn better from multimedia presentations. Last but certainly not least, the study showed that it could be much better when English textbooks on the market give much more place for non-native speakers to narrate the texts as well as native speakers. To generalize the findings, more studies could be conducted on different types of learners using different types of texts.

REFERENCES

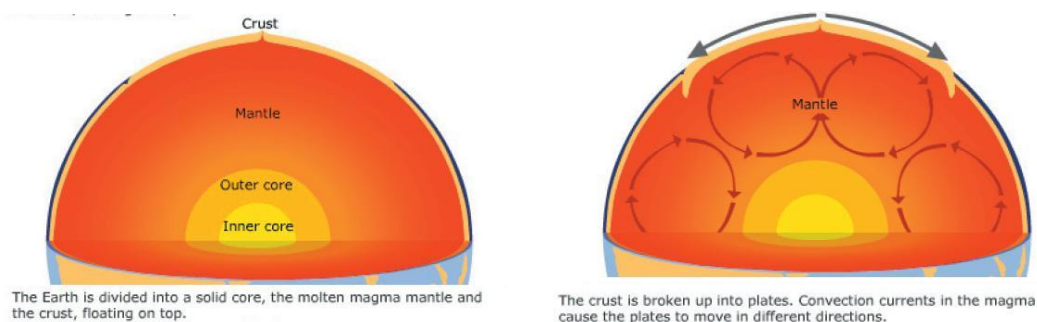
- Adesope, O., & Nesbit, J. C. (2012). Verbal redundancy in multimedia learning environments: A meta-analysis. *Journal of Educational Psychology*, 104(1), 250-263.
- Alderson, J. C. (1984). Reading in a foreign language: A reading problem or a language problem? In J. C. Alderson & A. H. Urquhart (Eds.), *Reading in a foreign language* (pp. 1-24). London: Longman.
- Baddeley, A. (1992). Working memory. *Science*, 255, 556-559.
- Bernhardt, E. (2005). Progress and procrastination in second language reading. *Annual Review of Applied Linguistics*, 25, 133-150.

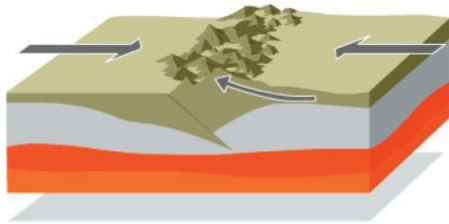
- Bernhardt, E. B., & Kamil, M. L. (1995). Interpreting relationships between L1 and L2 reading: Consolidating the linguistic threshold and the linguistic interdependence hypotheses. *Applied Linguistics*, 16, 15-34.
- Bilikozen, N., & Akyel, A. (2014). EFL Reading Comprehension, Individual Differences and Text Difficulty. *The Reading Matrix*, 14(2), 263-296.
- Bossers, B. (1991). On thresholds, ceilings and short-circuits: The relation between L1 reading, L2 reading and L2 knowledge. *AILA Review*, 8, 45-60.
- Carrell, P. L. (1991). Second language reading: Reading ability or language proficiency? *Applied Linguistics*, 12, 159-179.
- Carver, R. P. (1990). *Reading rate: A review of research and theory*. New York: Academic Press.
- Carver, R. P. (2000). *The cause of high and low reading achievement*. Mahwah, NJ: Erlbaum.
- Chandler, P., & Sweller, J. (1991). Cognitive load theory and the format of instruction. *Cognition and Instruction*, 8, 293-332.
- Clark, J. M., & Paivio, A. (1991). Dual coding theory and education. *Educational Psychology Review*, 3, 149-210.
- Clarke, M.A. (1980). The short circuit hypothesis of ESL reading: Or when language competence interferes with reading performance. *Modern Language Journal*, 64, 203-209.
- Clarke, M.A. (1988). The short circuit hypothesis of ESL reading: Or when language competence interferes with reading performance. In P.L. Carrell, J. Devine, & D.E. Eskey (Eds.), *Interactive approaches to second language reading* (pp. 114 - 24). New York: Cambridge University Press.
- Cohen, A. D., Olshtain, E., & Rosenstein, D. S. (1986). Advanced EFL apologies: What remains to be learned? *International Journal of the Sociology of Language*, 62, 51-74.
- Craig, S. D., Gholson, B., & Driscoll, D. M. (2002). Animated pedagogical agents in multimedia educational environments: Effects of agent properties, picture features, and redundancy. *Journal of Educational Psychology*, 94(2), 428-434.
- Cummins, J. (1979). Linguistic interdependence and the educational development of bilingual children. *Review of Educational Research*, 49(2), 222-251.
- Cummins, J. (1984). Implications of bilingual proficiency for the education of minority language students. In P. Allen, M. Swain, & C. Brumfit (Eds.), *Language issues and education policies: Exploring Canada's multilingual resources*. Oxford: Pergamon Press.
- Cummins, J. (1991). Interdependence of first and second language proficiency in bilingual children. In E. Bialystok (Ed.), *Language processing in bilingual children* (pp. 70-89). New York: Cambridge University Press.
- Cummins, J., & Mulcahy, R. (1978). Orientation to language in Ukrainian-English bilingual children. *Child Development*, 49, 1239-1242.
- Dawson, C. (2009). *Introduction to research methods*. Oxford: Oxford University Press.
- Diao, Y., & Sweller, J. (2007). Redundancy in foreign language reading comprehension instruction: Concurrent written and spoken presentations. *Learning and Instruction*, 17, 78-88.
- Durgunoglu, A.Y., Nagy, W. E., & Hancin-Bhatt, B. J. (1993). Cross-language transfer of phonological awareness. *Journal of Educational Psychology*, 85, 453-465.
- Goodman, K. S. (1973). Psycholinguistic universals of the reading process. In F. Smith (Ed.), *Psycholinguistics and reading* (pp. 21-29). New York: Holt, Rinehart and Winston.
- Gorsuch, G., & Taguchi, E. (2010). Developing reading fluency and comprehension using repeated reading: Evidence from longitudinal student reports. *Language Teaching Research*, 14(1), 27-59.
- Hakuta, K. (1976). A case study of a Japanese child learning English a second language. *Language Learning*, 26, 321-351.
- Hancin-Bhatt, B., & Bhatt, R. M. (1997). Optimal L2 syllables: Interactions of transfer and developmental effects. *Studies in Second Language Acquisition*, 19, 331-378.
- Hancin-Bhatt, B., & Nagy, W. (1994). Lexical transfer and second language morphological development. *Applied Psycholinguistics*, 15(3), 289-310.
- Jamet, E., & Bohec, O.L. (2007). The effect of redundant text in multimedia instruction. *Contemporary Educational Psychology*, 32, 588-598.
- Kalyuga, S., Chandler, P., & Sweller, J. (1998). Levels of expertise and instructional design. *Human Factors*, 40, 1-17.
- Kalyuga, S., Chandler, P., & Sweller, J. (1999). Managing split-attention and redundancy in multimedia instruction. *Applied Cognitive Psychology*, 13, 351-371.
- Ketabi, S., Ghavamnia, M., & Rezazadeh, M. (2012). Hypermedia Reading Strategies Used by Persian Graduate Students in TEFL: A Think-Aloud Study. *The Reading Matrix*, 12(1), 39-49.
- Koda, K. (1998). The role of phonemic awareness in L2 reading. *Second Language Research*, 14, 194-215.
- Koda, K. (1999). Development of L2 intraword structural sensitivity and decoding skills. *Modern Language Journal*, 83, 51-64.

- Leahy, W., Chandler, P., & Sweller, J. (2003). When auditory presentations should and should not be a component of multimedia instruction. *Applied Cognitive Psychology*, 17, 401–418.
- Legarreta, D. (1979). The effects of program models on language acquisition of Spanish speaking children. *TESOL Quarterly*, 13, 521-534.
- Mayer, R. E. (2001). *Multimedia learning*. New York: Cambridge University press.
- Mayer, R. E. (2005). *The Cambridge handbook of multimedia learning*. Cambridge: Cambridge University Press.
- Mayer, R. E., Heiser, J., & Lonn, S. (2001). Cognitive constraints on multimedia learning: When presenting more material results in less understanding. *Journal of Educational Psychology*, 93(1), 187–198.
- Mayer, R. E., & Moreno, R. (2003). Nine ways to reduce cognitive load in multimedia learning. *Educational Psychologist*, 38(1), 43–52.
- McCrudden, M. T., Hushman, C. J., & Marley, S. C. (2014). Exploring the boundary conditions of the redundancy principle. *The Journal of Experimental Education*, 82(4), 537-554.
- Moreno, R., & Mayer, R. E. (2002). Verbal redundancy in multimedia learning: When reading helps listening. *Journal of Educational Psychology*, 94(1), 156–163.
- Olshtain, E. (1983). Sociocultural competence and language transfer: the case of apology. In S. M. Gass & L. Selinker (Eds.), *Language transfer in language learning* (pp. 232-249). Rowley, MA: Newbury House.
- Paas, F., Renkl, A., & Sweller, J. (2003). Cognitive load theory and instructional design: Recent developments. *Educational Psychologist*, 38, 1–4.
- Paivio, A. (1986). *Mental representations: A dual coding approach*. New York: Oxford University Press.
- Rutherford, W. E. (1983). Language typology and language transfer. In S. M. Gass & L. Selinker (Eds.), *Language transfer in language learning* (pp. 358-370). Rowley, MA: Newbury House.
- Scarcella, R. C. (1983). Discourse accent in second language performance. In S. M. Gass & L. Selinker (Eds.), *Language transfer in language learning* (pp. 306-326). Rowley, MA: Newbury House.
- Soruç, A. (2011). "Does Language Proficiency Matter in Redundancy Principle?", *11th International Educational Technology Conference (IETC)*, İstanbul/TURKEY
- Soruç, A. (2015). What Makes Redundant Presentation of Multimedia Learning Difficult? *Procedia-Social and Behavioral Sciences*, 191, 2844-2848.
- Sweller, J. (1999). *Instructional design in technical areas*. Melbourne: ACER Press.
- Sweller, J., van Merriënboer, J. J. G., & Paas, F. (1998). Cognitive architecture and instructional design. *Educational Psychology Review*, 10, 251–296.
- Troike, R. C. (1978). Research evidence for the effectiveness of bilingual education. *NABE Journal*, 3, 13-24.
- Yanco, J. J. (1985). Language contact and grammatical interference: Hausa and Zarma in Niamey, Niger. *Studies in African Linguistics*, 9, 318-322.
- Yorio, C. A. (1971). Some sources of reading problems in foreign language learners. *Language Learning*, 21, 107-115.
- Yue, C. L., Bjork, E. L., & Bjork, R. A. (2013). Reducing verbal redundancy in multimedia learning: An undesired desirable difficulty? *Journal of Educational Psychology*, 105(2), 266-277.

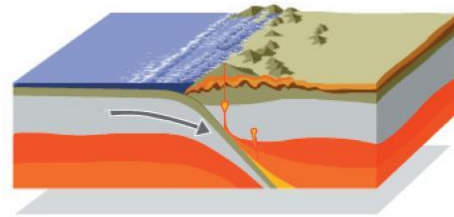
APPENDIX

An example slide from animation with simultaneous narration and on-screen text (ANT)

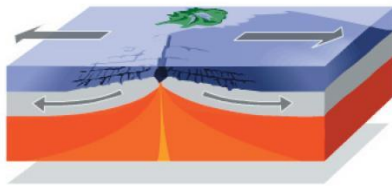




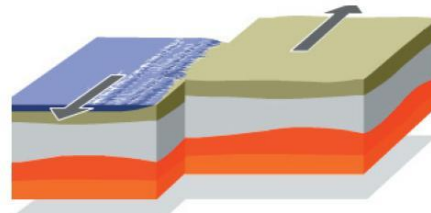
Where plates collide, rock layers are forced upwards creating mountains.



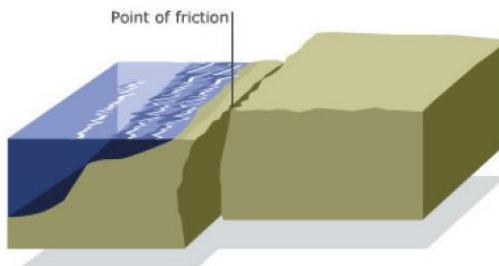
Where plates converge, one plate is drawn slowly beneath the other. This takes place over thousands of years.



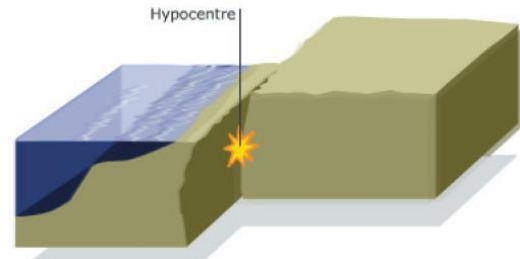
Where plates diverge, lava emerges from the mantle and cools to form new sections of crust. Diverging plate boundaries are often found underwater.



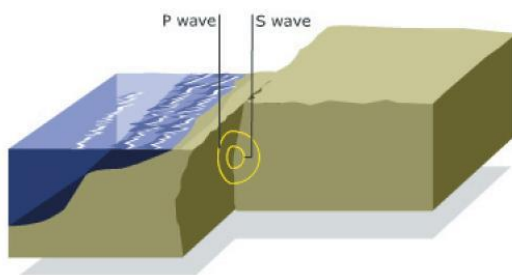
Other plates move very slowly alongside each other. Faults are found at the edges of the plates where the crust is moving in different directions.



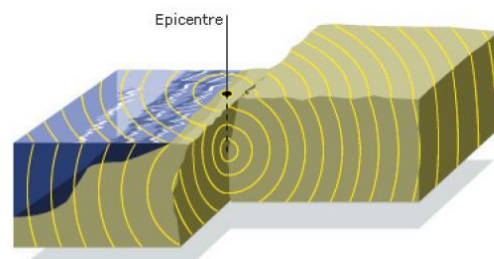
In some places the plates become locked together. Kinetic energy builds up in the locked plates.



When the plates give, the stored energy is released in the form of an earthquake. The point of the earthquake's origin beneath the surface is called the hypocentre.



An earthquake emits its power as three waves of energy. Primary, or P-waves are felt as a sudden jolt. Secondary, or S-waves waves arrive a few seconds later and are felt as a more sustained side-to-side shaking.



Surface waves radiate outwards from the epicentre - the point on the surface directly above the hypocentre - and arrive after the main P and S waves.